Name: \_\_\_\_\_ July 16, 2009 MATH 1012 Midterm

You may use a calculator. You may not use any notes or books. Per the CU Honor code you may neither give nor receive unauthorized assistance.

- 1. Convert a speed of 4 miles per hour into units of feet per minute. Note that 1 mile = 5280 feet and 1 hour = 60 minutes.
- 2. Make an order of magnitude estimate for how many hours the average person sleeps in a lifetime. Show your work. Any reasonable answer will be accepted as long as the work is complete and correct. Answer in scientific notation.

- Consider the following argument: Premise: Everyone who goes to work walks to work. Premise: Sam went to work today. Conclusion: Sam walked to work.
  - (a) Is the argument deductive or inductive?
  - (b) If applicable, is the argument valid?
  - (c) If applicable, is the argument sound?

4. Consider the following argument:

Premise: Since I moved to my new apartment last year, my neighbors have had parties every Saturday night. Premise: Tomorrow is Saturday.

Conclusion: My neighbors will have a party tomorrow night.

- (a) Is the argument deductive or inductive?
- (b) If applicable, is the argument valid?
- (c) If applicable, is the argument sound?
- 5. In the last year, the U.S. unemployment rate rose from 5% to 9%.
  - (a) What was the absolute change in the unemployment rate? (Your answer should have units of "percentage *points*")

(b) What was the relative change in the unemployment rate? Your answer should be written in the form of a percentage.

- 6. Let A be the set of all negative integers, let B be the set of all natural numbers, and let C be the set of all integers.
  - (a) Draw a Venn diagram showing the relationship between the sets A, B, and C.

- (b) Describe the numbers (if any) in set C but neither in A nor B.
- (c) Give an example of a number that is not in any of the sets A, B, or C.
- 7. Write the following numbers in scientific notation:
  - (a) 103,800
  - (b) .023
  - (c) 35%
- 8. Boulder's average yearly rainfall is 70% less than the average yearly rainfall in Portland. If the average yearly rainfall in Portland is 60 inches, what is the average yearly rainfall in Boulder?